MYCOTAXON

Volume 111, pp. 143–148 *January–March 2010*

Phylloporus colligatus sp. nov., a new gilled bolete from Guyana

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Abstract—*Phylloporus colligatus* from Guyana is described for the first time. The species occurs in forests dominated by *Dicymbe* trees. The taxon is unique for *Phylloporus* due to its rare to infrequent clamp connections at the basal septa of basidia and on hymenophoral trama hyphae, and hyaline fusoid hymenial cystidia.

Key words—*Boletaceae*, *Caesalpinioideae*, neotropics, taxonomy

Introduction

In Guyana, forests with ectomycorrhizal (EM) *Dicymbe* spp. (*Fabaceae* subfam. *Caesalpinioideae*, tribe *Amherstieae*) contain taxa of several genera of *Boletaceae* sensu lato (Henkel 1999, Henkel et al. 2002, Fulgenzi et al. 2007, 2008, 2010; Mayor et al. 2008). This bolete assemblage includes the lamellate *Phylloporus* Quél., which comprises 70 species worldwide, largely with tropical distributions (Corner 1970, Halling 1989, Halling et al. 1999, Montoya & Bandala 1991, Singer & Gómez 1984, Singer et al. 1990). Here we describe a new species of *Phylloporus* from Guyana that is unique because it has clamp connections at the base of some of the basidia and at the septa of a few hymenophoral trama hyphae and hyaline fusoid hymenial cystidia.

Materials and methods

Collections were made during the May–July rainy season of 2001 from the Upper Potaro River Basin, within a 5 km radius of a permanent base camp at 5° 18' 04.8" N; 59° 54' 40.4" W; elevation 710 m. This collecting site is located in an undulating valley

approximately 20 km east of Mt. Ayanganna (2200 m), and is densely forested with a mosaic of primary *Dicymbe*-dominated and mixed forests of the *Eschweilera-Licania* association (Henkel 2003).

Macromorphological features were described fresh in the field. Colors were described subjectively and coded according to Kornerup & Wanscher (1978), with color plates noted in parentheses (e.g., 4A7). Macrochemical tests were performed according to the methods of Singer (1986). Fungi were field-dried with silica gel.

Microscopic sections were mounted in 5% KOH solution and Melzer's reagent after being rehydrated with ethanol and then in water. The sections were observed with an Olympus BH-2 light microscope. Mean Q is the average of length/width derived from each basidiospore measured. To test for the fleeting amyloid reaction, a small piece of a lamella was mounted in Melzer's reagent and carefully compressed between the slide and cover slip (Watling & Gregory 1991, Ladurner & Simonini 2003). A positive reaction is visible to the naked eye as a color change of the tissue to blue when the slide is placed on white paper. Line drawings were made with the aid of a drawing tube. Specimens were deposited in the following herbaria: BRG and HSU (Holmgren et al. 1990). The microscopic descriptions were generated from a Delta database (Dallwitz 1980, Dallwitz et al. 1993 onwards).

Taxonomy

Phylloporus colligatus M.A. Neves & T.W. Henkel, **sp. nov.** Figs 1–2

Mycobank MB 515394

Pileo plano-convexo, rubro-brunneo vel aureo-brunneo, sicco, subtomentoso, 10–17 mm lato, cum NH_4 caerulescenti mox brunneo. Contextus flavus, immutatus. Lamellis decurrentis vel adnaxis, flavis, ubi contusi atroflavis. Stipes aequalus, aureus. Contextus albidus vel flavus. Mycelio basali flavo. Sporis 8.4–9.8 × 3.5–4.2 µm. Hyphis fibulatis.

Type: Guyana, Region 8 (Potaro-Siparuni), Pakaraima Mountains, Upper Potaro River Basin, 15 km east of Ayanganna Mountain, 3 km southwest of base camp, 5 May 2001, *Henkel 8026* (BRG, **holotype**; HSU, **isotype**).

Etymology: *colligatus*, from the Latin for "connected", due to the presence of clamp connections.

key characters — *Phylloporus colligatus* is distinguished microscopically by the presence of clamp connections at the base of some of the basidia and the septa of a few hymenophoral trama hyphae, and hyaline fusoid hymenial cystidia. This taxon can be easily recognized as a member of *Phylloporus* because of the following: a lamellate, yellow hymenophore; presence of hymenial cystidia; and the pale yellow color of the spores when mounted in KOH (Singer 1986). Its combination of macro- and microscopic features is unique among described species of *Phylloporus*.

Macrocharacters — Pileus 10–17 mm broad, 5–9 mm high, plano-convex, dry, surface even, finely matted subtomentose throughout; reddish orange-brown (7E8–8E8); margin entire, slightly inrolled when young. Pileus trama 1 mm at margin, to 5 mm thick over stipe, off-white, unchanging.

Hymenophore lamellate. Lamellae subdistant, adnate to subdecurrent, 2–3 mm tall, occasionally forking at midpoint, light yellow (4A7–4A8), staining brighter yellow when bruised; edge concolorous, even; lamellulae 1–2. Stipe 30–45 mm long, 2–4 mm wide, equal, curved, dry; upper half glabrous when young, dull orangish (5C6–5C7) throughout; lower half orangish yellow; solid; trama off-white, solid, unchanging. Basal mycelium pale yellow. Odor minimal, non-distinctive. Taste none. spore deposit not obtained (Fig. 1).

Fig. 1. Basidiomata of *Phylloporus colligatus* (brg holotype Henkel 8026). Bar = 10 mm.

Microcharacters — Basidiospores 8.4–9.8 µm long, 3.5–4.2 µm wide, mean Q = 2.36, subfusoid, smooth, inamyloid, pale yellow in KOH (Fig. 2a). Basidia 34.3–37.8 µm long, 6.3–8.4 µm wide, clavate, pale yellow in KOH, 4-sterigmate, rarely 5 (Fig. 2b). Hymenial cystidia 42–45.5 µm long, 7–7.7 µm wide, more common on sides of lamellae, hyaline, clavate to fusoid (Fig. 2c) or lanceolate, thin walled, encrusting pigment absent. Hymenophoral trama bilateral; hyphae 4.9–7 µm wide, cylindric, yellowish. Pileipellis an ixotrichodermium; hyphae cylindric, thin walled, pale yellow in KOH. Pileus trama interwoven; hyphae hyaline. Stipitipellis hyphae vertically oriented, parallel, subcylindric or cylindric, yellow. Stipe trama hyphae parallel, 6.3–10.5 µm wide, cylindric, pale yellow in KOH. Clamp connections not observed in all the septa, rare to infrequent at basal septa of basidia and on hymenophoral trama hyphae.

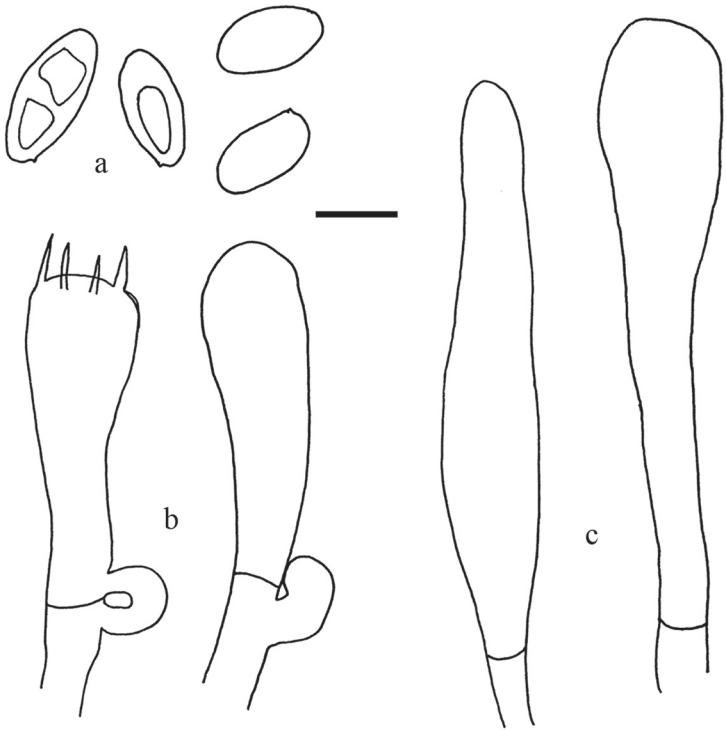

Fig. 2. Microscopic features of *Phylloporus colligatus* (BRG holotype Henkel 8026). a. Basidiospores. b. Basidiole and basidium with basal clamp connections. c. Hymenial cystidia. Bar = 10 µm.

Macrochemical reactions — NH_4 instantly blue on pileus surface, rapidly changing to dull burgundy-brown. Fleeting amyloid reaction weakly positive on lamellae.

Ecology, range, distribution — Rare and solitary on root mat in forests dominated by *Dicymbe corymbosa*, known only from the type locality in the Upper Potaro River Basin of Guyana.

Comments — *Phylloporus colligatus* is similar to *P. phaeoxanthus* Singer & L.D. Gómez var. *phaeoxanthus* (*Singer 20583*, holotype!, F), a neotropical species known from Costa Rica, Colombia, and Mexico (Singer & Gómez 1984), but the hyphae of *P. phaeoxanthus* lack clamp connections and its hymenial cystidia are encrusted. *Phylloporus colligatus* could also be confused with *P. phaeoxanthus* var. *simplex* Singer & L.D. Gómez (*Singer 20623*, holotype!, F), a common species in Costa Rica (Singer & Gómez 1984) that differs from

P. colligatus by its ventricose-shaped cystidia with encrusting pigment and the absence of clamp connections.

Other neotropical *Phylloporus* species with clamp connections, which might be confused with *P. colligatus*, include *P. fibulatus* Singer et al. (*Ovrebo 2546*, isotype!, NY) from Colombia (Singer et al. 1990) and *P. foliiporus* (Murrill) Singer (*F17747*, holotype!, FH) from Florida and Alabama, United States (Singer 1945). *Phylloporus fibulatus* is distinguished from *P. colligatus* by its yellow pileus with a brown NH_4 reaction, greater abundance of clamp connections seen in all tissues, cylindric to fusiform cystidia, and a subporoid hymenophore. *Phylloporus foliiporus* differs from *P. colligatus* in its larger basidiospores (10.5–12.6 × 4.2–4.9 µm), cystidia with melleous apices, and a blue-green ammonia reaction that does not turn burgundy brown.

Among African *Phylloporus*, the only species known with clamp connections is *P. pseudopaxillus* Heinem. & Rammeloo (Heinemann & Rammeloo 1987). However, *P. pseudopaxillus* clearly differs from *P. colligatus* in having larger, longer basidiospores (11.3–14.8 × 3.8–4.9 µm), and abundant clamp connections in all tissues of the basidioma.

Acknowledgments

The first author thanks Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Brasil) for the financial support during her Ph.D training. The first author and REH are grateful to the National Science Foundation for partial support from grants BSR-8600424, DEB-9300798, DEB-9972018, DEB-0414665. TWH acknowledges funding from a National Science Foundation Grant (DEB-0918591) and funding from the National Geographic Society for grant #7341-02 that supported the field work. Our special thanks to Drs. Timothy J. Baroni and Juan Luis Mata for their critical comments and revisions.

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